



#14

SEQUENCE LISTING

<110> YU, LEI

<120> MU OPIOID RECEPTOR: COMPOSITIONS AND METHODS

<130> INDA:002USD1

<140> 09/841,720

<141> 2001-04-24

<150> 08/120,601

<151> 1993-09-13

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<170> PatentIn Ver. 2.1

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<212> DNA

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gctgtgagag gaagaggctg gggcgctgg aaccgaaaa gtctgagtgc tctcagttac 180

agcctaccta gtccgcagca ggccttcagc acc atg gac agc agc acc ggc cca 234

Met Asp Ser Ser Thr Gly Pro

1

5

ggg aac acc agc gac tgc tca gac ccc tta gct cag gca agt tgc tcc 282

Gly Asn Thr Ser Asp Cys Ser Asp Pro Leu Ala Gln Ala Ser Cys Ser

10

15

20

cca gca cct ggc tcc tgg ctg aac ttg tcc cac gtt gat ggc aac cag 330

Pro Ala Pro Gly Ser Trp Leu Asn Leu Ser His Val Asp Gly Asn Gln

25

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tcc gat cca tgc ggt ctg aac cgc acc ggg ctt ggc ggg aac gac agc 378

Ser Asp Pro Cys Gly Leu Asn Arg Thr Gly Leu Gly Gly Asn Asp Ser

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45

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55

ctg tgc cct cag acc ggc agc cct tcc atg gtc aca gcc att acc atc 426

Leu Cys Pro Gln Thr Gly Ser Pro Ser Met Val Thr Ala Ile Thr Ile

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65

70

atg gcc ctc tac tct atc gtg tgt gta gtg ggc ctc ttc gga aac ttc 474
Met Ala Leu Tyr Ser Ile Val Cys Val Val Gly Leu Phe Gly Asn Phe
75 80 85

ctg gtc atg tat gtg att gta aga tac acc aaa atg aag act gcc acc 522
Leu Val Met Tyr Val Ile Val Arg Tyr Thr Lys Met Lys Thr Ala Thr
90 95 100

aac atc tac att ttc aac ctt gct ctg gca gac gcc tta gcg acc agt 570
Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Ala Leu Ala Thr Ser
105 110 115

aca ctg ccc ttt cag agt gtc aac tac ctg atg gga aca tgg ccc ttc 618
Thr Leu Pro Phe Gln Ser Val Asn Tyr Leu Met Gly Thr Trp Pro Phe
120 125 130 135

gga acc atc ctc tgc aag atc gtg atc tca ata gat tac tac aac atg 666
Gly Thr Ile Leu Cys Lys Ile Val Ile Ser Ile Asp Tyr Tyr Asn Met
140 145 150

ttc acc agc ata ttc acc ctc tgc acc atg agc gtg gac cgc tac att 714
Phe Thr Ser Ile Phe Thr Leu Cys Thr Met Ser Val Asp Arg Tyr Ile
155 160 165

gct gtc tgc cac cca gtc aaa gcc ctg gat ttc cgt acc ccc cga aat 762
Ala Val Cys His Pro Val Lys Ala Leu Asp Phe Arg Thr Pro Arg Asn
170 175 180

gcc aaa atc gtc aac gtc tgc aac tgg atc ctc tct tct gcc atc ggt 810
Ala Lys Ile Val Asn Val Cys Asn Trp Ile Leu Ser Ser Ala Ile Gly
185 190 195

ctg cct gta atg ttc atg gca acc aca aaa tac agg cag ggg tcc ata 858
Leu Pro Val Met Phe Met Ala Thr Thr Lys Tyr Arg Gln Gly Ser Ile
200 205 210 215

gat tgc acc ctc acg ttc tcc cac cca acc tgg tac tgg gag aac ctg 906
Asp Cys Thr Leu Thr Phe Ser His Pro Thr Trp Tyr Trp Glu Asn Leu
220 225 230

ctc aaa atc tgt gtc ttt atc ttc gct ttc atc atg ccg atc ctc atc 954
Leu Lys Ile Cys Val Phe Ile Phe Ala Phe Ile Met Pro Ile Leu Ile
235 240 245

atc act gtg tgt tac ggc ctg atg atc tta cga ctc aag agc gtt cgc 1002
Ile Thr Val Cys Tyr Gly Leu Met Ile Leu Arg Leu Lys Ser Val Arg
250 255 260

atg cta tcg ggc tcc aaa gaa aag gac agg aat ctg cgc agg atc acc 1050
Met Leu Ser Gly Ser Lys Glu Lys Asp Arg Asn Leu Arg Arg Ile Thr
265 270 275

cgg atg gtg ctg gtg gtc gtg gct gta ttt atc gtc tgc tgg acc ccc 1098
Arg Met Val Leu Val Val Val Ala Val Phe Ile Val Cys Trp Thr Pro

B1
Cont.

Gly Leu Gly Gly Asn Asp Ser Leu Cys Pro Gln Thr Gly Ser Pro Ser
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 Met Val Thr Ala Ile Thr Ile Met Ala Leu Tyr Ser Ile Val Cys Val
 65 70 75 80
 Val Gly Leu Phe Gly Asn Phe Leu Val Met Tyr Val Ile Val Arg Tyr
 85 90 95
 Thr Lys Met Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu
 100 105 110
 Ala Asp Ala Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Val Asn Tyr
 115 120 125
 Leu Met Gly Thr Trp Pro Phe Gly Thr Ile Leu Cys Lys Ile Val Ile
 130 135 140
 Ser Ile Asp Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Cys Thr
 145 150 155 160
 Met Ser Val Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu
 165 170 175
 Asp Phe Arg Thr Pro Arg Asn Ala Lys Ile Val Asn Val Cys Asn Trp
 180 185 190
 Ile Leu Ser Ser Ala Ile Gly Leu Pro Val Met Phe Met Ala Thr Thr
 195 200 205
 Lys Tyr Arg Gln Gly Ser Ile Asp Cys Thr Leu Thr Phe Ser His Pro
 210 215 220
 Thr Trp Tyr Trp Glu Asn Leu Leu Lys Ile Cys Val Phe Ile Phe Ala
 225 230 235 240
 Phe Ile Met Pro Ile Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Ile
 245 250 255
 Leu Arg Leu Lys Ser Val Arg Met Leu Ser Gly Ser Lys Glu Lys Asp
 260 265 270
 Arg Asn Leu Arg Arg Ile Thr Arg Met Val Leu Val Val Val Ala Val
 275 280 285
 Phe Ile Val Cys Trp Thr Pro Ile His Ile Tyr Val Ile Ile Lys Ala
 290 295 300
 Leu Ile Thr Ile Pro Glu Thr Thr Phe Gln Thr Val Ser Trp His Phe
 305 310 315 320
 Cys Ile Ala Leu Gly Tyr Thr Asn Ser Cys Leu Asn Pro Val Leu Tyr
 325 330 335

B1
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Ala	Phe	Leu	Asp	Glu	Asn	Phe	Lys	Arg	Cys	Phe	Arg	Glu	Phe	Cys	Ile
		340						345					350		
Pro	Thr	Ser	Ser	Thr	Ile	Glu	Gln	Gln	Asn	Ser	Thr	Arg	Val	Arg	Gln
		355					360					365			
Asn	Thr	Arg	Glu	His	Pro	Ser	Thr	Ala	Asn	Thr	Val	Asp	Arg	Thr	Asn
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 gctgtgagag gaagaggctg gggcgcgctgg aacccgaaaa gtctgagtgc tctcagttac 180
 agcctaccta gtccgcagca ggccttcagc accatggaca gcagcaccgg cccagggaac 240
 accagcgact gctcagaccc cttagctcag gcaagttgct cccagcacc tggctcctgg 300
 ctcaacttgt cccacgttga tggcaaccag tccgatcc atg cgg tct gaa ccg cac 356
 Met Arg Ser Glu Pro His
 1 5

cgg gct tgg cgg gaa cga cag cct gtg ccc tca gac cgg cag ccc ttc 404
 Arg Ala Trp Arg Glu Arg Gln Pro Val Pro Ser Asp Arg Gln Pro Phe
 10 15 20
 cat ggt cac agc cat tac cat cat ggc cct cta ctc tat cgt gtg tgt 452
 His Gly His Ser His Tyr His His Gly Pro Leu Leu Tyr Arg Val Cys
 25 30 35
 agt ggg cct ctt cgg aaa ctt cct ggt cat gta tgt gat tgt aag ata 500
 Ser Gly Pro Leu Arg Lys Leu Pro Gly His Val Cys Asp Cys Lys Ile
 40 45 50
 cac caa aat gaa gac tgc cac caa cat cta cat ttt caa cct tgc tct 548
 His Gln Asn Glu Asp Cys His Gln His Leu His Phe Gln Pro Cys Ser
 55 60 65 70

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cct gat ggg aac atg gcc ctt cgg aac cat cct ctg caa gat cgt gat	644
Pro Asp Gly Asn Met Ala Leu Arg Asn His Pro Leu Gln Asp Arg Asp	
90 95 100	
ctc aat aga tta cta caa cat gtt cac cag cat att cac cct ctg cac	692
Leu Asn Arg Leu Leu Gln His Val His Gln His Ile His Pro Leu His	
105 110 115	
cat gag cgt gga ccg cta cat tgc tgt ctg cca ccc agt caa agc cct	740
His Glu Arg Gly Pro Leu His Cys Cys Leu Pro Pro Ser Gln Ser Pro	
120 125 130	
gga ttt ccg tac ccc ccg aaa tgc caa aat cgt caa cgt ctg caa ctg	788
Gly Phe Pro Tyr Pro Pro Lys Cys Gln Asn Arg Gln Arg Leu Gln Leu	
135 140 145 150	
gat cct ctc ttc tgc cat cgg tct gcc tgt aat gtt cat ggc aac cac	836
Asp Pro Leu Phe Cys His Arg Ser Ala Cys Asn Val His Gly Asn His	
155 160 165	
aaa ata cag gca ggg gtc cat aga ttg cac cct cac gtt ctc cca ccc	884
Lys Ile Gln Ala Gly Val His Arg Leu His Pro His Val Leu Pro Pro	
170 175 180	
aac ctg gta ctg gga gaa cct gct caa aat ctg tgt ctt tat ctt cgc	932
Asn Leu Val Leu Gly Glu Pro Ala Gln Asn Leu Cys Leu Tyr Leu Arg	
185 190 195	
ttt cat cat gcc gat cct cat cat cac tgt gtg tta cgg cct gat gat	980
Phe His His Ala Asp Pro His His His Cys Val Leu Arg Pro Asp Asp	
200 205 210	
ctt acg act caa gag cgt tgc cat gct atc ggg ctc caa aga aaa gga	1028
Leu Thr Thr Gln Glu Arg Ser His Ala Ile Gly Leu Gln Arg Lys Gly	
215 220 225 230	
cag gaa tct gcg cag gat cac ccg gat ggt gct ggt ggt cgt ggc tgt	1076
Gln Glu Ser Ala Gln Asp His Pro Asp Gly Ala Gly Gly Arg Gly Cys	
235 240 245	
att tat cgt ctg ctg gac ccc cat cca cat cta cgt cat cat caa agc	1124
Ile Tyr Arg Leu Leu Asp Pro His Pro His Leu Arg His His Gln Ser	
250 255 260	
gct gat cac gat tcc aga aac cac att tca gac cgt ttc ctg gca ctt	1172
Ala Asp His Asp Ser Arg Asn His Ile Ser Asp Arg Phe Leu Ala Leu	
265 270 275	
ctg cat tgc ttt ggg tta cac gaa cag ctg cct gaa tcc agt tct tta	1220
Leu His Cys Phe Gly Leu His Glu Gln Leu Pro Glu Ser Ser Ser Leu	

B1
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285

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cgc ctt cct gga tgaaaacttc aagcgatgct tcagagagtt ctgcatccca 1272
 Arg Leu Pro Gly
 295

acctcggtcca cgatcgaaca gcaaaaactcc actcgagtcc gtcagaacac tagggaacat 1332
 ccctccacgg ctaatacagt ggatcgaact aaccaccagc tagaaaatct ggaggcagaa 1392
 actgctccat tgccttaact ggggtctcaca ccatccagac cctcgctaag cttagaggcc 1452
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 accatctgat cctgcattca aagtcattcc tctctggcta cttcactctg cacatgagag 1572
 atgctcagac tgatcaagac cagaagaaag aagagactac cggaca 1618

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Leu Leu Tyr Arg Val Cys Ser Gly Pro Leu Arg Lys Leu Pro Gly His
 35 40 45

Val Cys Asp Cys Lys Ile His Gln Asn Glu Asp Cys His Gln His Leu
 50 55 60

His Phe Gln Pro Cys Ser Gly Arg Arg Leu Ser Asp Gln Tyr Thr Ala
 65 70 75 80

Leu Ser Glu Cys Gln Leu Pro Asp Gly Asn Met Ala Leu Arg Asn His
 85 90 95

Pro Leu Gln Asp Arg Asp Leu Asn Arg Leu Leu Gln His Val His Gln
 100 105 110

His Ile His Pro Leu His His Glu Arg Gly Pro Leu His Cys Cys Leu
 115 120 125

Pro Pro Ser Gln Ser Pro Gly Phe Pro Tyr Pro Pro Lys Cys Gln Asn
 130 135 140

Arg Gln Arg Leu Gln Leu Asp Pro Leu Phe Cys His Arg Ser Ala Cys
 145 150 155 160

B1
 cont.

Asn Val His Gly Asn His Lys Ile Gln Ala Gly Val His Arg Leu His
 165 170 175
 Pro His Val Leu Pro Pro Asn Leu Val Leu Gly Glu Pro Ala Gln Asn
 180 185 190
 Leu Cys Leu Tyr Leu Arg Phe His His Ala Asp Pro His His His Cys
 195 200 205
 Val Leu Arg Pro Asp Asp Leu Thr Thr Gln Glu Arg Ser His Ala Ile
 210 215 220
 Gly Leu Gln Arg Lys Gly Gln Glu Ser Ala Gln Asp His Pro Asp Gly
 225 230 235 240
 Ala Gly Gly Arg Gly Cys Ile Tyr Arg Leu Leu Asp Pro His Pro His
 245 250 255
 Leu Arg His His Gln Ser Ala Asp His Asp Ser Arg Asn His Ile Ser
 260 265 270
 Asp Arg Phe Leu Ala Leu Leu His Cys Phe Gly Leu His Glu Gln Leu
 275 280 285
 Pro Glu Ser Ser Ser Leu Arg Leu Pro Gly
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 35 40 45
 Ala Ile Ala Ile Thr Ala Leu Tyr Ser Ala Val Cys Ala Val Gly Leu
 50 55 60
 Leu Gly Asn Val Leu Val Met Phe Gly Ile Val Arg Tyr Thr Lys Leu
 65 70 75 80
 Lys Thr Ala Thr Asn Ile Tyr Ile Phe Asn Leu Ala Leu Ala Asp Ala
 85 90 95
 Leu Ala Thr Ser Thr Leu Pro Phe Gln Ser Val Asn Tyr Leu Met Glu
 100 105 110
 Thr Trp Pro Phe Gly Glu Leu Leu Cys Lys Ala Val Leu Ser Ile Asp
 115 120 125
 Tyr Tyr Asn Met Phe Thr Ser Ile Phe Thr Leu Thr Met Met Ser Val
 130 135 140
 Asp Arg Tyr Ile Ala Val Cys His Pro Val Lys Ala Leu Asp Phe Arg
 145 150 155 160
 Thr Pro Ala Lys Ala Lys Leu Ile Asn Ile Cys Ile Trp Val Leu Ala
 165 170 175
 Ser Gly Val Gly Val Pro Ile Met Val Met Ala Val Thr Gln Pro Arg
 180 185 190
 Asp Gly Ala Val Val Cys Met Leu Gln Phe Pro Ser Pro Ser Trp Tyr
 195 200 205
 Trp Asp Thr Val Thr Lys Ile Cys Val Phe Ile Phe Ala Phe Val Val
 210 215 220
 Pro Ile Leu Ile Ile Thr Val Cys Tyr Gly Leu Met Leu Leu Arg Leu
 225 230 235 240
 Arg Ser Val Arg Leu Leu Ser Gly Ser Lys Glu Lys Asp Arg Ser Leu
 245 250 255
 Arg Arg Ile Thr Arg Met Val Leu Val Val Val Gly Ala Phe Val Val
 260 265 270
 Cys Trp Ala Pro Ile His Ile Phe Val Ile Val Trp Thr Leu Val Asp
 275 280 285

B1
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Ile Asn Arg Arg Asp Pro Leu Val Val Ala Ala Leu His Leu Cys Ile
290 295 300

Ala Leu Gly Tyr Ala Asn Ser Ser Leu Asn Pro Val Leu Tyr Ala Phe
305 310 315 320

Leu Asp Glu Asn Phe Lys Arg Cys Phe Arg Gln Leu Cys Arg Thr Pro
325 330 335

Cys Gly Arg Gln Glu Pro Gly Ser Leu Arg Arg Pro Arg Gln Ala Thr
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Thr Arg Glu Arg Val Thr Ala Cys Thr Pro Ser Asp Gly Pro Gly Gly
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Gly Ala Ala Ala
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Gly Ala Ala Asp Gly Met Glu Glu Pro Gly Arg Asn Leu Ser Gln Asn
35 40 45

Gly Thr Leu Ser Glu Gly Gln Gly Ser Ala Ile Leu Ile Ser Phe Ile
50 55 60

Tyr Ser Val Val Cys Leu Val Gly Leu Cys Gly Asn Ser Met Val Ile
65 70 75 80

Tyr Val Ile Leu Arg Tyr Ala Lys Met Lys Thr Ala Thr Asn Ile Tyr
85 90 95

Ile Leu Asn Leu Ala Ile Ala Asp Glu Leu Leu Met Leu Ser Val Pro
100 105 110

Phe Leu Val Thr Ser Thr Leu Leu Arg His Trp Pro Phe Gly Ala Leu
115 120 125

Leu Cys Arg Leu Val Leu Ser Val Asp Ala Tyr Asn Met Phe Thr Ser
130 135 140

Ile Tyr Cys Leu Thr Val Leu Ser Val Asp Arg Tyr Val Ala Val Val
145 150 155 160

B1
Cont

His Pro Ile Lys Ala Ala Arg Tyr Arg Arg Pro Thr Val Ala Lys Val
 165 170 175
 Val Asn Leu Gly Val Trp Val Leu Ser Leu Leu Val Ile Leu Pro Ile
 180 185 190
 Val Val Phe Ser Arg Thr Ala Ala Asn Ser Asp Gly Thr Val Ala Cys
 195 200 205
 Asn Met Leu Met Pro Glu Pro Ala Gln Arg Trp Leu Val Gly Phe Val
 210 215 220
 Leu Tyr Thr Phe Leu Met Gly Phe Leu Leu Pro Val Gly Ala Ile Cys
 225 230 235 240
 Leu Cys Tyr Val Leu Ile Ile Ala Lys Met Arg Met Val Ala Leu Lys
 245 250 255
 Ala Gly Trp Gln Gln Arg Lys Arg Ser Glu Arg Lys Ile Thr Leu Met
 260 265 270
 Val Met Met Val Val Met Val Phe Val Ile Cys Trp Met Pro Phe Tyr
 275 280 285
 Val Val Gln Leu Val Asn Val Phe Ala Glu Gln Asp Asp Ala Thr Val
 290 295 300
 Ser Gln Leu Ser Val Ile Leu Gly Tyr Ala Asn Ser Cys Ala Asn Pro
 305 310 315 320
 Ile Leu Tyr Gly Phe Leu Ser Asp Asn Phe Lys Arg Ser Phe Gln Arg
 325 330 335
 Ile Leu Cys Leu Ser Trp Met Asp Asn Ala Ala Glu Glu Pro Val Asp
 340 345 350
 Tyr Tyr Ala Thr Ala Leu Lys Ser Arg Ala Tyr Ser Val Glu Asp Phe
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 Ala Ser Arg Ile Ser Thr Leu
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Gln Thr Glu Pro Tyr Tyr Asp Met Thr Ser Asn Ala Val Leu Thr Phe	35	40	45
Ile Tyr Phe Val Val Cys Val Val Gly Leu Cys Gly Asn Thr Leu Val	50	55	60
Ile Tyr Val Ile Leu Arg Tyr Ala Lys Met Lys Thr Ile Thr Asn Ile	65	70	75
Tyr Ile Leu Asn Leu Ala Ile Ala Asp Glu Leu Phe Met Leu Gly Leu	85	90	95
Pro Phe Leu Ala Met Gln Val Ala Leu Val His Trp Pro Phe Gly Lys	100	105	110
Ala Ile Cys Arg Val Val Met Thr Val Asp Gly Ile Asn Gln Phe Thr	115	120	125
Ser Ile Phe Cys Leu Thr Val Met Ser Ile Asp Arg Tyr Leu Ala Val	130	135	140
Val His Pro Ile Lys Ser Ala Lys Trp Arg Arg Pro Arg Thr Ala Lys	145	150	155
Met Ile Asn Val Ala Val Trp Gly Val Ser Leu Leu Val Ile Leu Pro	165	170	175
Ile Met Ile Tyr Ala Gly Leu Arg Ser Asn Gln Trp Gly Arg Ser Ser	180	185	190
Cys Thr Ile Asn Trp Pro Gly Glu Ser Gly Ala Trp Tyr Thr Gly Phe	195	200	205
Ile Ile Tyr Ala Phe Ile Leu Gly Phe Leu Val Pro Leu Thr Ile Ile	210	215	220
Cys Leu Cys Tyr Leu Arg Ile Ile Ile Lys Val Lys Ser Ser Gly Ile	225	230	235
Arg Val Gly Ser Ser Lys Arg Lys Lys Ser Glu Lys Lys Val Thr Arg	245	250	255
Met Val Ser Ile Val Val Ala Val Phe Ile Phe Cys Trp Leu Pro Phe	260	265	270
Tyr Ile Phe Asn Val Ser Ser Val Ser Val Ala Ile Ser Pro Thr Pro	275	280	285
Ala Leu Lys Gly Met Phe Asp Phe Val Val Ile Leu Thr Tyr Ala Asn			

B1
cont.

290

295

300

Ser Cys Ala Asn Pro Ile Leu Tyr Ala Phe Leu Ser Asp Asn Phe Lys
305 310 315 320

Lys Ser Phe Gln Asn Val Leu Cys Leu Val Lys Val Ser Gly Ala Glu
325 330 335

Asp Gly Glu Arg Ser Asp Ser Lys Gln Asp Lys Ser Arg Leu Asn Glu
340 345 350

Thr Thr Glu Thr Gln Arg Thr Leu Leu Asn Gly Asp Leu Gln Thr Ser
355 360 365

Ile
